

Innomar's SES-2000 Software

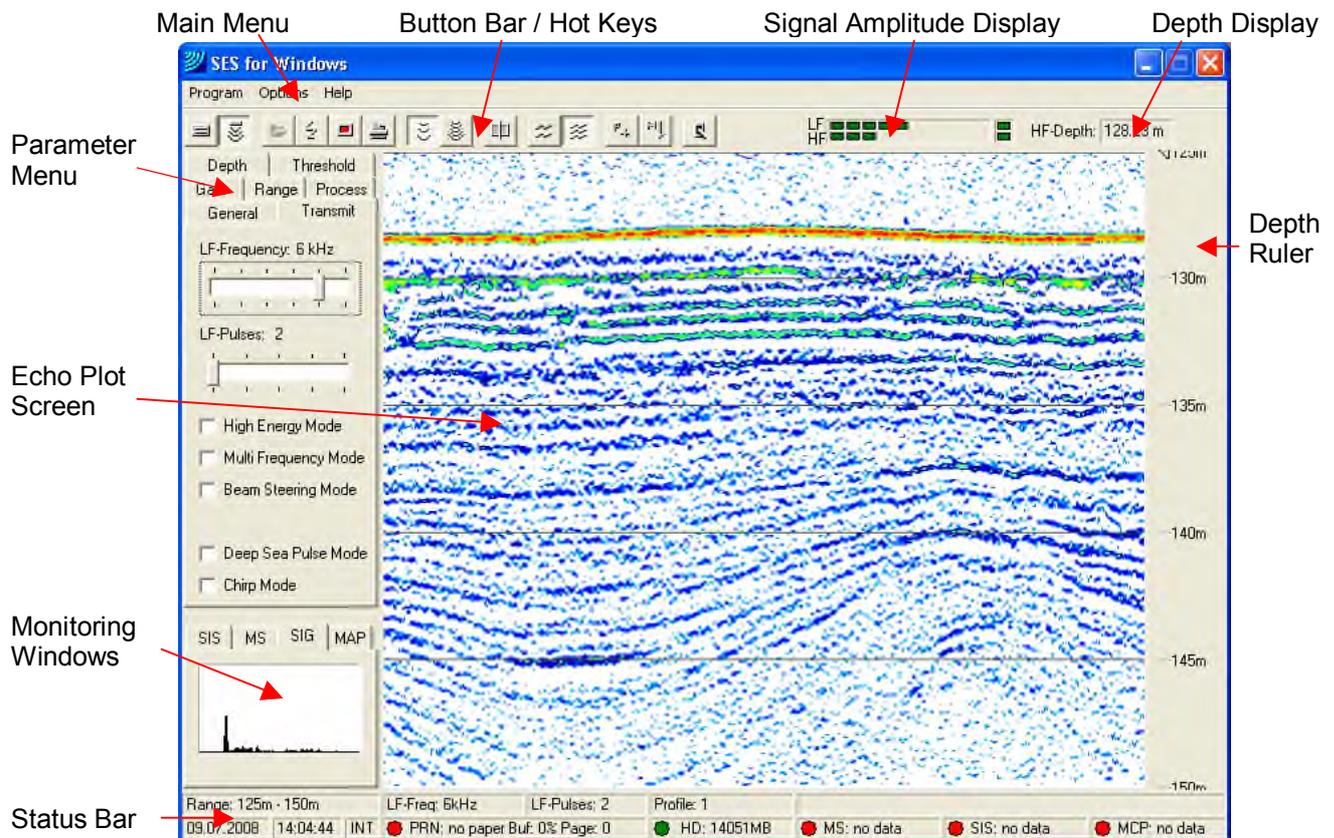
This document gives a brief overview on Innomar's software for the SES-2000 family of parametric sub-bottom profilers.

Overview

The SES-2000 SBPs come with the following Innomar software:

- **SESWIN** control and data acquisition software
- **SES Netview** software:
This is used for online display of SBP data and system settings on slave monitors for QC and supervision.
- **SES Convert** data converter software:
If the SES-2000 user likes to use third-party software for processing the data, this software can be used to export SES-2000 data into SEG-Y format.
- **ISE** post-processing software:
With ISE you can re-process the digitally stored SES-2000 data print the data, digitise layers and objects and extract these data to common file formats (ASCII, AutoCad DXF, CODA, IVS Fledermaus).

SESWIN Control and Data Acquisition Software (Online Operation)



SESWIN Survey Settings

Before survey and data acquisition are started, some basic settings have to be made once within the options menu:

- synchronization/trigger mode,
- transducer draught and water sound velocity (for depth calculations),
- transducer and/or antenna offsets (for correct position data handling),
- location where data files should be recorded,
- navigation (position) data interface settings,
- motion sensor settings,
- settings for serial (depth) output,
- online coordinate transform settings,
- beam-steering and multi-frequency options.

SESWIN Settings During Data Acquisition

There are buttons and assigned hot keys for basic operation like

- switch on/off transmission, data record and online printing,
- select channel displayed on the echoprint screen (LF channel / HF channel / both),
- select data processing mode for online echoprint,
- set manual event marker,
- increase profile number.

Only few settings will directly influence data quality. These settings have to be monitored by the operator:

- transmit pulse characteristics (usually set once at the beginning of the survey),
- gain settings (HF and LF channel),
- range for data collection.

Range and gain settings can be applied manually or using sophisticated algorithms for automatic range control or automatic gain control (AGC)

SESWIN Online Data Processing for Echoprint Generation

There are several settings available for online data processing:

- heave compensation and swell filtering,
- bandpass filters are applied automatically according to transmission pulse characteristics,
- noise reduction using different filters and stacking/smoothing,
- matched filtering and spike removal,
- automatic gain control (AGC) and time variant gain (TVG),
- different algorithms for colour mapping.

These settings will not affect quality of recorded data.

SESWIN Online Data Export

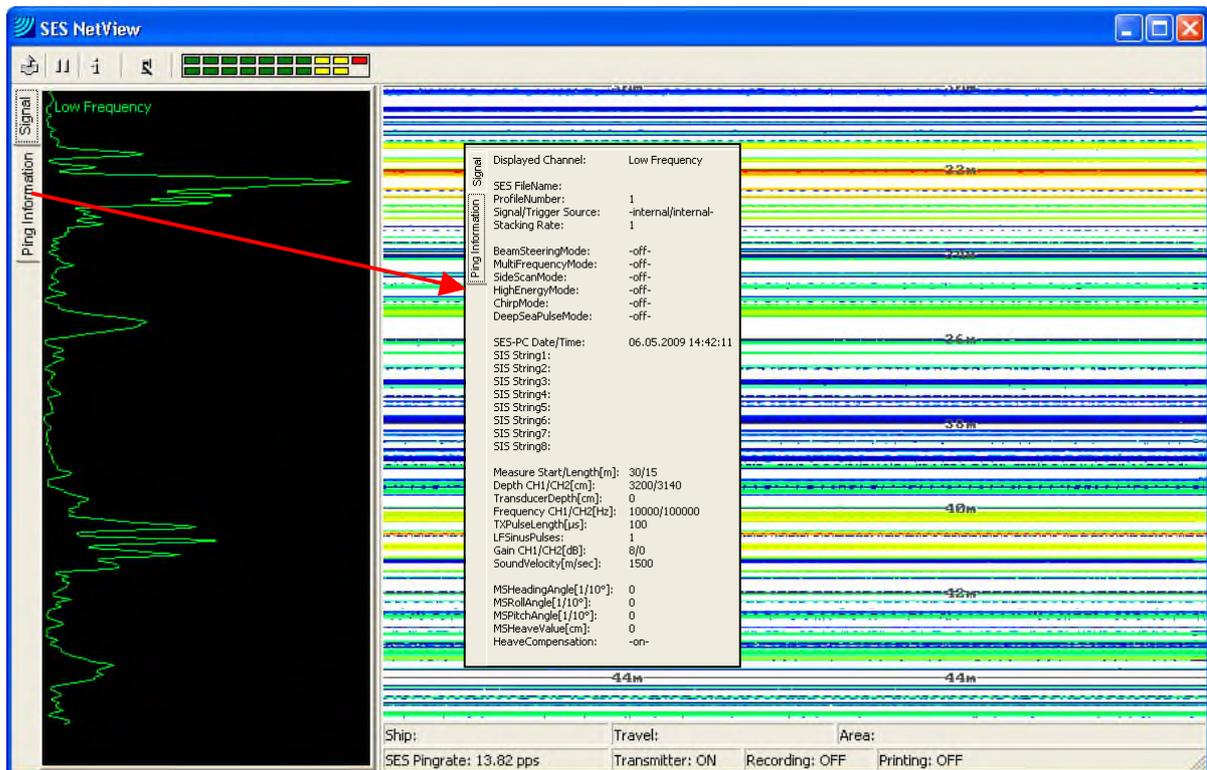
There is a serial output (COM port) for online calculated water depth values. Data are transmitted as user configurable NMEA string, additional information like GPS position can be included.

Echoprint data and auxiliary information can be sent via ethernet network (LAN) to monitoring stations. There is also a data export to the HYPACK hydrographic survey software package available.

SES NetView Software

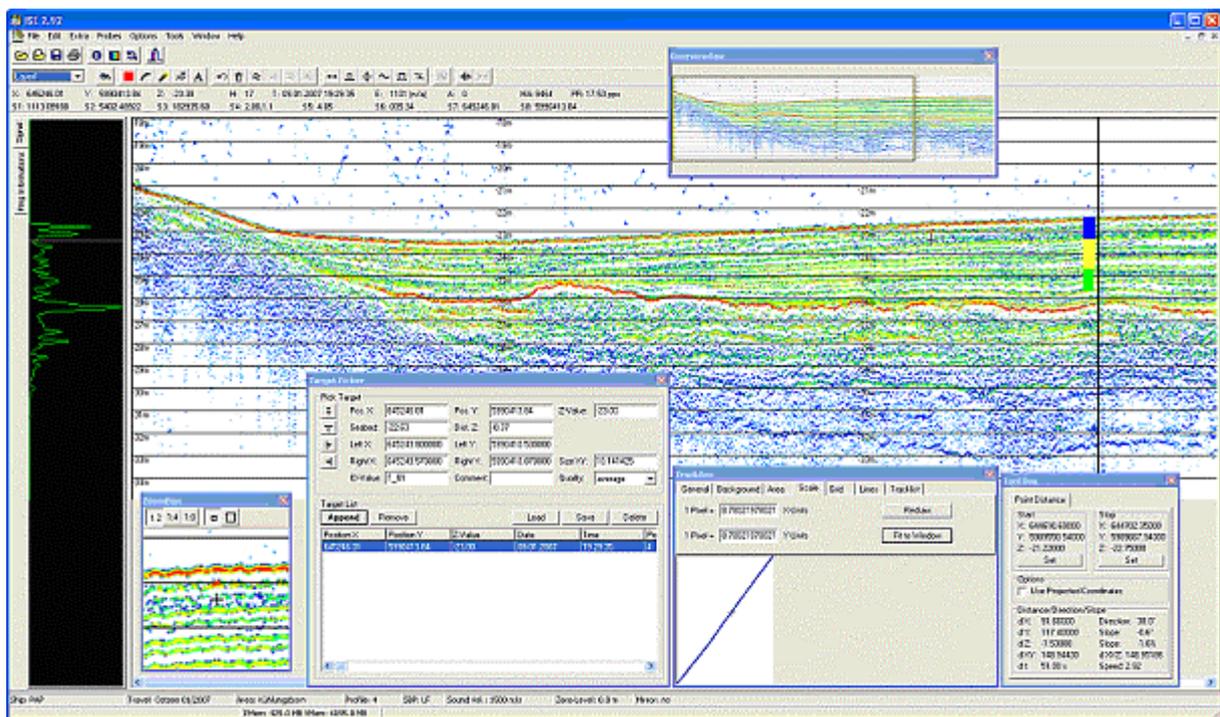
Sometimes it is useful to have echoprint data and main system settings available on another (remote) screen(s) in order to give a second operator or supervisor the possibility to QC the online data acquisition. For this the SESWIN Broadcast Server can be utilized to display echoprint data and SESWIN status information on different remote computers. It is not possible to remote-control the SES-2000 system by this connection. For remote-controlled operation of SES-2000 sub-bottom profilers the SESWIN software can be used.

To display the SES data on remote computers the “SES NetView” software delivered with all SES-2000 systems has to be used. It will show the echoprint screen like on the SES-2000 control computer as well as the most important system parameters and sensor data, see figure below.



ISE Post-Processing Software

ISE is a post-processing software tool for data acquired with Innomar's SES-96 / SES-2000 parametric sub-bottom profilers. With ISE you can load the digitally stored data, apply different processing algorithms and processing methods to the data, print the data, digitise layers and objects and extract these data to common file formats, like ASCII. Data files can also be converted to SEG-Y, XTF and ASCII format for processing with third party software.



ISE screen dump (example with different toolboxes opened and sediment probe data overlaid to the echoprint)

The ISE screen consists of the following parts:

- main menu,
- button bar,
- info bar: shows information about trace or sample at current cursor position (e.g., xyz position, time, trace number, amplitude),
- echoprint area: shows calculated echoprint,
- trace envelope / general trace information: shows envelope graph or information from trace at current cursor position (e.g., motion sensor data, transmitter and gain settings),
- status bar: shows information about data file.

There are some toolboxes available that may be used to

- show the entire echoprint (data file) in reduced size and indicate the area visible in the ISE echoprint area (overview box),
- calculate distance, slope, direction, velocity between two cursor positions (tool box),
- show a magnified part of the echoprint around current cursor position (zoom box),
- show position track of the entire data file and indicate position at cursor (track box),
- pick and digitize object positions and dimensions (target picker).

Some of these toolboxes are also shown in the picture above.

To recalculate echoprints there are different signal processing options like:

- equidistant mapping along track,
- tide correction,
- heave compensation and swell filtering,
- applying sound velocity profiles,
- noise reduction (different filters and stacking/smoothing algorithms),
- spike and ghost removal,
- normalize gain,
- different colour mapping,
- instantaneous amplitude, phase, frequency or apparent polarity (full waveform data only),
- SAS processing (option),
- digitize water depth, sediment layers as well as object positions and dimensions,
- overlay probe data (e.g., sediment or density probes),
- convert / improve position data or other auxiliary data.

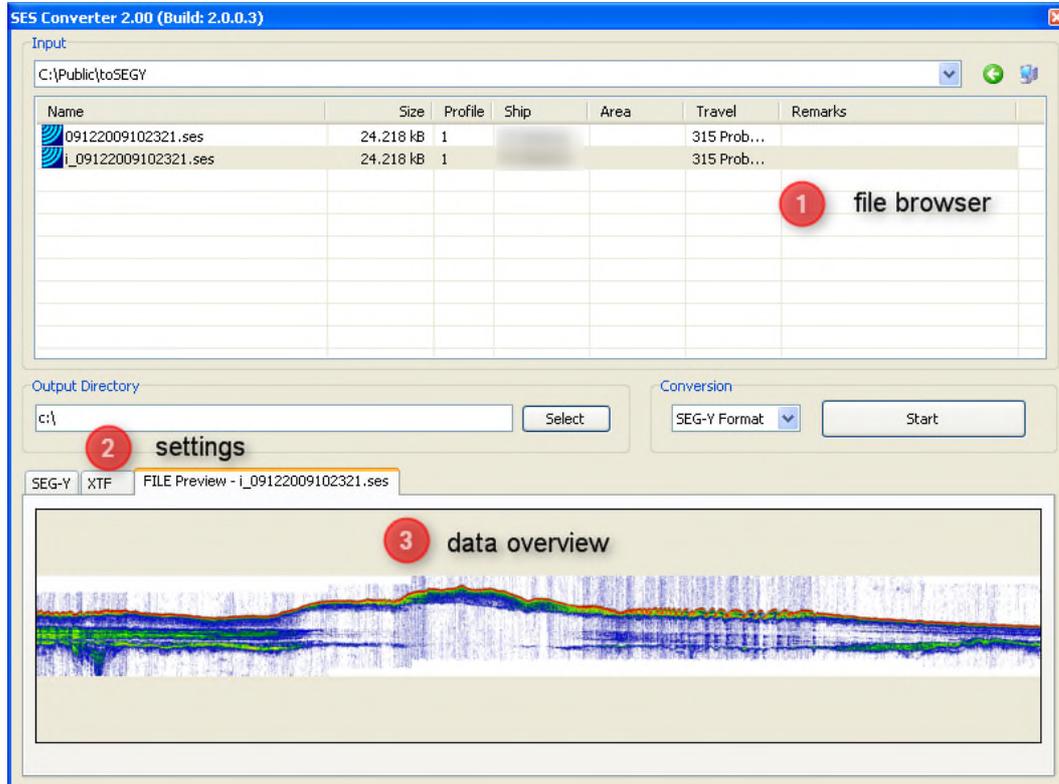
It is also possible to cut or assemble SES data files. There are also tools available to assist geophysical interpretation. Optionally there is also a seabed classification module available.

Calculated data can be stored in different formats for documentation or for further processing with ISE or third-party software:

- echoprint graphic (different graphic formats),
- track info, position data (ASCII),
- digitized layer data (ASCII xyz, CODA, PIPE),
- digitized object data (ASCII),
- amplitude values for all data samples for all pings,
- SES data.

SES Convert Data Converter Software

There is a special tool available to convert Innomar's SES-2000 data files into SEG-Y data format: Innomar's sesconvert programme.



After selecting a file within the file browser there is a simple echoplot of the data shown and basic file information is given below the file selector. An enlarged file preview can be obtained by left- double clicking into the echoplot picture.

Before starting the conversion there are some settings required to fit the SEG-Y format requirements of the target software:

- coordinate (position data) scaling,
- data channels,
- range correction,
- heave correction,
- reduce sample rate,
- altitude correction,
- byte order: little or big endian,